

SEQUENCE LISTING

<110> Chapple, Clinton

Franke, Rochus

Ruegger, Maxwell

<120> Genes Encoding P-Coumarate 3-Hydroxylase (C3H) and Methods of Use

<130> N1422-005

<150> US 60/225554

<151> 2000-08-16

<160> 7

<170> PatentIn version 3.0

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<211> 1527

<212> DNA

<213> Arabidopsis thaliana

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aaagaagttc tgaaagaaca cgaccagaaa ctcgccgacc ggcaccggaa cagatcgacg 300

gaagcattta gccgcaacgg tcaggatctt atatggggcc attatggggcc tcattacgtg 360
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<213> *Arabidopsis thaliana*

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gaagcattta gccgcaacgg tcaggatctt atatgggccc attatgggcc tcattacgtg	360
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<212> DNA

<213> *Arabidopsis thaliana*

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tgtggacgag caagggcttg agttcaaggc catagtatcc aacgggtctga agctaggtgc	660
ttcactgtca atagctgaac acatcccgtg gctcaggtgg atgtttccgg ctgatgagaa	720
ggcgtttgct gagcacgggg ctcgtcgtga ccgcctcact cgagctatca tggaggagca	780
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cacggcaggg atggacacga cagcgataac agcggaatgg gcgatggcgg aaatgatcaa	960
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gatcttaacc gaggcagatt tctcccgtt accttacttg caatgcgtgg tgaaagagtc	1080
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Pro Lys Pro Ile Val Gly Asn Leu Tyr Asp Ile Lys Pro Val Arg Phe
35 40 45

Arg Cys Tyr Tyr Glu Trp Ala Gln Ser Tyr Gly Pro Ile Ile Ser Val
50 55 60

Trp Ile Gly Ser Ile Leu Asn Val Val Val Ser Ser Ala Glu Leu Ala
65 70 75 80

Lys Glu Val Leu Lys Glu His Asp Gln Lys Leu Ala Asp Arg His Arg
85 90 95

Asn Arg Ser Thr Glu Ala Phe Ser Arg Asn Gly Gln Asp Leu Ile Trp
100 105 110

Ala Asp Tyr Gly Pro His Tyr Val Lys Val Arg Lys Val Cys Thr Leu
115 120 125

Glu Leu Phe Thr Pro Lys Arg Leu Glu Ser Leu Arg Pro Ile Arg Glu
130 135 140

Asp Glu Val Thr Ala Met Val Glu Ser Val Phe Arg Asp Cys Asn Leu
145 150 155 160

Pro Glu Asn Arg Ala Lys Gly Leu Gln Leu Arg Lys Tyr Leu Gly Ala
165 170 175

Val Ala Phe Asn Asn Ile Thr Arg Leu Ala Phe Gly Lys Arg Phe Met
180 185 190

Asn Ala Glu Gly Val Val Asp Glu Gln Gly Leu Glu Phe Lys Ala Ile
195 200 205

Val Ser Asn Gly Leu Lys Leu Gly Ala Ser Leu Ser Ile Ala Glu His
 210 215 220
 Ile Pro Trp Leu Arg Trp Met Phe Pro Ala Asp Glu Lys Ala Phe Ala
 225 230 235 240
 Glu His Gly Ala Arg Arg Asp Arg Leu Thr Arg Ala Ile Met Glu Glu
 245 250 255
 His Thr Leu Ala Arg Gln Lys Ser Ser Gly Ala Lys Gln His Phe Val
 260 265 270
 Asp Ala Leu Leu Thr Leu Lys Asp Gln Tyr Asp Leu Ser Glu Asp Thr
 275 280 285
 Ile Ile Gly Leu Leu Trp Asp Met Ile Thr Ala Gly Met Asp Thr Thr
 290 295 300
 Ala Ile Thr Ala Glu Trp Ala Met Ala Glu Met Ile Lys Asn Pro Arg
 305 310 315 320
 Val Gln Gln Lys Val Gln Glu Glu Phe Asp Arg Val Val Gly Leu Asp
 325 330 335
 Arg Ile Leu Thr Glu Ala Asp Phe Ser Arg Leu Pro Tyr Leu Gln Cys
 340 345 350
 Val Val Lys Glu Ser Phe Arg Leu His Pro Pro Thr Pro Leu Met Leu
 355 360 365
 Pro His Arg Ser Asn Ala Asp Val Lys Ile Gly Gly Tyr Asp Ile Pro
 370 375 380
 Lys Gly Ser Asn Val His Val Asn Val Trp Ala Val Ala Arg Asp Pro
 385 390 395 400
 Ala Val Trp Lys Asn Pro Phe Glu Phe Arg Pro Glu Arg Phe Leu Glu
 405 410 415
 Glu Asp Val Asp Met Lys Gly His Asp Phe Arg Leu Leu Pro Phe Gly
 420 425 430
 Ala Gly Arg Arg Val Cys Pro Gly Ala Gln Leu Gly Ile Asn Leu Val
 435 440 445
 Thr Ser Met Met Ser His Leu Leu His His Phe Val Trp Thr Pro Pro
 450 455 460
 Gln Gly Thr Lys Pro Glu Glu Ile Asp Met Ser Glu Asn Pro Gly Leu
 465 470 475 480
 Val Thr Tyr Met Arg Thr Pro Val Gln Ala Val Ala Thr Pro Arg Leu
 485 490 495

Pro Ser Asp Leu Tyr Lys Arg Val Pro Tyr Asp Met
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<212> PRT

<213> Arabidopsis thaliana

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Pro Lys Pro Ile Val Gly Asn Leu Tyr Asp Ile Lys Pro Val Arg Phe
35 40 45

Arg Cys Tyr Tyr Glu Trp Ala Gln Ser Tyr Gly Pro Ile Ile Ser Val
50 55 60

Trp Ile Gly Ser Ile Leu Asn Val Val Val Ser Ser Ala Glu Leu Ala
65 70 75 80

Lys Glu Val Leu Lys Glu His Asp Gln Lys Leu Ala Asp Arg His Arg
85 90 95

Asn Arg Ser Thr Glu Ala Phe Ser Arg Asn Gly Gln Asp Leu Ile Trp
100 105 110

Ala Asp Tyr Gly Pro His Tyr Val Lys Val Arg Lys Val Cys Thr Leu
115 120 125

Glu Leu Phe Thr Pro Lys Arg Leu Glu Ser Leu Arg Pro Ile Arg Glu
130 135 140

Asp Glu Val Thr Ala Met Val Glu Ser Val Phe Arg Asp Cys Asn Leu
145 150 155 160

Pro Glu Asn Arg Ala Lys Gly Leu Gln Leu Arg Lys Tyr Leu Gly Ala
165 170 175

Val Ala Phe Asn Asn Ile Thr Arg Leu Ala Phe Gly Lys Arg Phe Met
180 185 190

Asn Ala Glu Gly Val Val Asp Glu Gln Gly Leu Glu Phe Lys Ala Ile
195 200 205

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Pro Ser Asp Leu Tyr Lys Arg Val Pro Tyr Asp Met
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<212> PRT

<213> Arabidopsis thaliana

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Phe Arg Cys Tyr Tyr Glu Trp Ala Gln Ser Tyr Gly Pro Ile Ile Ser
20 25 30

Val Trp Ile Gly Ser Ile Leu Asn Val Val Val Ser Ser Ala Glu Leu
35 40 45

Ala Lys Glu Val Leu Lys Glu His Asp Gln Lys Leu Ala Asp Arg His
50 55 60

Arg Asn Arg Ser Thr Glu Ala Phe Ser Arg Asn Gly Gln Asp Leu Ile
65 70 75 80

Trp Ala Asp Tyr Gly Pro His Tyr Val Lys Val Arg Lys Val Cys Thr
85 90 95

Leu Glu Leu Phe Thr Pro Lys Arg Leu Glu Ser Leu Arg Pro Ile Arg
100 105 110

Glu Asp Glu Val Thr Ala Met Val Glu Ser Val Phe Arg Asp Cys Asn
115 120 125

Leu Pro Glu Asn Arg Ala Lys Gly Leu Gln Leu Arg Lys Tyr Leu Gly
130 135 140

Ala Val Ala Phe Asn Asn Ile Thr Arg Leu Ala Phe Gly Lys Arg Phe
145 150 155 160

Met Asn Ala Glu Gly Val Val Asp Glu Gln Gly Leu Glu Phe Lys Ala
165 170 175

Ile Val Ser Asn Gly Leu Lys Leu Gly Ala Ser Leu Ser Ile Ala Glu
180 185 190

His Ile Pro Trp Leu Arg Trp Met Phe Pro Ala Asp Glu Lys Ala Phe
195 200 205

Ala Glu His Gly Ala Arg Arg Asp Arg Leu Thr Arg Ala Ile Met Glu
 210 215 220
 Glu His Thr Leu Ala Arg Gln Lys Ser Ser Gly Ala Lys Gln His Phe
 225 230 235 240
 Val Asp Ala Leu Leu Thr Leu Lys Asp Gln Tyr Asp Leu Ser Glu Asp
 245 250 255
 Thr Ile Ile Gly Leu Leu Trp Asp Met Ile Thr Ala Gly Met Asp Thr
 260 265 270
 Thr Ala Ile Thr Ala Glu Trp Ala Met Ala Glu Met Ile Lys Asn Pro
 275 280 285
 Arg Val Gln Gln Lys Val Gln Glu Glu Phe Asp Arg Val Val Gly Leu
 290 295 300
 Asp Arg Ile Leu Thr Glu Ala Asp Phe Ser Arg Leu Pro Tyr Leu Gln
 305 310 315 320
 Cys Val Val Lys Glu Ser Phe Arg Leu His Pro Pro Thr Pro Leu Met
 325 330 335
 Leu Pro His Arg Ser Asn Ala Asp Val Lys Ile Gly Gly Tyr Asp Ile
 340 345 350
 Pro Lys Gly Ser Asn Val His Val Asn Val Trp Ala Val Ala Arg Asp
 355 360 365
 Pro Ala Val Trp Lys Asn Pro Phe Glu Phe Arg Pro Glu Arg Phe Leu
 370 375 380
 Glu Glu Asp Val Asp Met Lys Gly His Asp Phe Arg Leu Leu Pro Phe
 385 390 395 400
 Gly Ala Gly Arg Arg Val Cys Pro Gly Ala Gln Leu Gly Ile Asn Leu
 405 410 415
 Val Thr Ser Met Met Ser His Leu Leu His His Phe Val Trp Thr Pro
 420 425 430
 Pro Gln Gly Thr Lys Pro Glu Glu Ile Asp Met Ser Glu Asn Pro Gly
 435 440 445
 Leu Val Thr Tyr Met Arg Thr Pro Val Gln Ala Val Ala Thr Pro Arg
 450 455 460
 Leu Pro Ser Asp Leu Tyr Lys Arg Val Pro Tyr Asp Met
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<210> 7

<211> 477

<212> PRT

<213> Arabidopsis thaliana

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Val	Trp	Ile	Gly	Ser	Ile	Leu	Asn	Val	Val	Val	Ser	Ser	Ala	Glu	Leu	35	40	45	
Ala	Lys	Glu	Val	Leu	Lys	Glu	His	Asp	Gln	Lys	Leu	Ala	Asp	Arg	His	50	55	60	
Arg	Asn	Arg	Ser	Thr	Glu	Ala	Phe	Ser	Arg	Asn	Gly	Gln	Asp	Leu	Ile	65	70	75	80
Trp	Ala	Asp	Tyr	Gly	Pro	His	Tyr	Val	Lys	Val	Arg	Lys	Val	Cys	Thr	85	90	95	
Leu	Glu	Leu	Phe	Thr	Pro	Lys	Arg	Leu	Glu	Ser	Leu	Arg	Pro	Ile	Arg	100	105	110	
Glu	Asp	Glu	Val	Thr	Ala	Met	Val	Glu	Ser	Val	Phe	Arg	Asp	Cys	Asn	115	120	125	
Leu	Pro	Glu	Asn	Arg	Ala	Lys	Gly	Leu	Gln	Leu	Arg	Lys	Tyr	Leu	Gly	130	135	140	
Ala	Val	Ala	Phe	Asn	Asn	Ile	Thr	Arg	Leu	Ala	Phe	Gly	Lys	Arg	Phe	145	150	155	160
Met	Asn	Ala	Glu	Gly	Val	Val	Asp	Glu	Gln	Gly	Leu	Glu	Phe	Lys	Ala	165	170	175	
Ile	Val	Ser	Asn	Gly	Leu	Lys	Leu	Gly	Ala	Ser	Leu	Ser	Ile	Ala	Glu	180	185	190	
His	Ile	Pro	Trp	Leu	Arg	Trp	Met	Phe	Pro	Ala	Asp	Glu	Lys	Ala	Phe	195	200	205	
Ala	Glu	His	Gly	Ala	Arg	Arg	Asp	Arg	Leu	Thr	Arg	Ala	Ile	Met	Glu	210	215	220	
Glu	His	Thr	Leu	Ala	Arg	Gln	Lys	Ser	Ser	Gly	Ala	Lys	Gln	His	Phe	225	230	235	240
Val	Asp	Ala	Leu	Leu	Thr	Leu	Lys	Asp	Gln	Tyr	Asp	Leu	Ser	Glu	Asp	245	250	255	

Thr Ile Ile Gly Leu Leu Trp Asp Met Ile Thr Ala Gly Met Asp Thr
260 265 270

Thr Ala Ile Thr Ala Glu Trp Ala Met Ala Glu Met Ile Lys Asn Pro
275 280 285

Arg Val Gln Gln Lys Val Gln Glu Glu Phe Asp Arg Val Val Gly Leu
290 295 300

Asp Arg Ile Leu Thr Glu Ala Asp Phe Ser Arg Leu Pro Tyr Leu Gln
305 310 315 320

Cys Val Val Lys Glu Ser Phe Arg Leu His Pro Pro Thr Pro Leu Met
325 330 335

Leu Pro His Arg Ser Asn Ala Asp Val Lys Ile Gly Gly Tyr Asp Ile
340 345 350

Pro Lys Gly Ser Asn Val His Val Asn Val Trp Ala Val Ala Arg Asp
355 360 365

Pro Ala Val Trp Lys Asn Pro Phe Glu Phe Arg Pro Glu Arg Phe Leu
370 375 380

Glu Glu Asp Val Asp Met Lys Gly His Asp Phe Arg Leu Leu Pro Phe
385 390 395 400

Gly Ala Gly Arg Arg Val Cys Pro Gly Ala Gln Leu Asp Ile Asn Leu
405 410 415

Val Thr Ser Met Met Ser His Leu Leu His His Phe Val Trp Thr Pro
420 425 430

Pro Gln Gly Thr Lys Pro Glu Glu Ile Asp Met Ser Glu Asn Pro Gly
435 440 445

Leu Val Thr Tyr Met Arg Thr Pro Val Gln Ala Val Ala Thr Pro Arg
450 455 460

Leu Pro Ser Asp Leu Tyr Lys Arg Val Pro Tyr Asp Met
465 470 475